

In the Claims

Please amend the claims as follows.

1 1. (Currently amended) A method for host vehicle internetworking, comprising:
2 coupling a plurality of network elements in a vehicle including at least one node
3 and at least one vehicle bus among at least one peripheral electronic device, wherein the
4 at least one node includes at least one gateway node in the vehicle, the gateway node
5 comprising a first processor performing real-time processes and a second processor
6 performing remaining processes other than the real-time processes;
7 manipulating node information including configuration and security information;
8 automatically assembling and configuring the plurality of network elements in
9 response to the node information;
10 remotely controlling at least one function of the plurality of network elements;
11 and
12 providing secure interoperability among the plurality of network elements in
13 response to the node information.

1 2. (Original) The method of claim 1, further comprising accessing the at least
2 one node and performing at least one function using at least one local development
3 network, wherein the at least one function is selected from a group consisting of
4 upgrading, diagnosing, and programming.

1 3. (Original) The method of claim 1, further comprising manipulating and
2 transferring entertainment software among the plurality of network elements using at
3 least one local development network, wherein the entertainment software comprises at
4 least one entertainment feature selected from a group consisting of video, audio, movies,
5 television shows, music, games, and simulations.

1 4. (Original) The method of claim 1, wherein the at least one vehicle bus
2 comprises at least one bus selected from a group consisting of at least one Original
3 Equipment Manufacturer (OEM) bus, at least one Automotive Multimedia Interface

4 Consortium (AMI-C) bus, at least one external network, and at least one local
5 development network.

1 5. (Original) The method of claim 1, wherein the at least one vehicle bus
2 comprises at least one legacy automotive bus selected from a group consisting of Audio
3 Control Protocol (ACP) buses and Standard Corporate Protocol (SCP) buses.

1 6. (Original) The method of claim 1, further comprising coupling the at least
2 one peripheral electronic device to at least one OEM bus, wherein the at least one
3 peripheral electronic device is selected from a group consisting of climate control
4 devices, actuator devices, position location devices, Global Positioning System (GPS)
5 devices, communication devices, cellular telephony devices, processing devices,
6 diagnostic devices, modems, video devices, audio devices, multimedia devices, electronic
7 game devices, sensor devices, switch devices, and device subnetworks.

1 7. (Original) The method of claim 1, further comprising coupling the at least
2 one peripheral electronic device to at least one AMI-C bus, wherein the at least one
3 peripheral electronic device is selected from a group consisting of communication
4 devices, position location devices, GPS devices, communication devices, pager devices,
5 cellular telephony devices, processing devices, modems, video devices, audio devices,
6 multimedia devices, electronic game devices, personal digital assistants (PDAs), and
7 wireless local area network (LAN) devices.

1 8. (Original) The method of claim 1, wherein the at least one node comprises at
2 least one interface port selected from a group consisting of Intelligent Data Bus (IDB-C)
3 ports, MOST ports, Institute of Electrical and Electronics Engineers (IEEE) 1394 ports,
4 On-Board Diagnostic-II (OBD-II) ports, Standard Corporate Protocol (SCP) ports, Audio
5 Control Protocol (ACP) ports, Bluetooth ports, Personal Communications Service (PCS)
6 ports, Global System for Mobile Communications (GSM) ports, and Ethernet ports.

1 9. (Original) The method of claim 1, further comprising:

2 hosting the at least one function on a central network element;
3 distributing the at least one function among the plurality of network elements in
4 response to a coupling of additional peripheral electronic devices to the at least one
5 vehicle bus.

1 10. (Currently amended) The method of claim 1, wherein the at least one node
2 includes the at least one gateway node and at least one port node, wherein the at least one
3 node provides at least one function selected from a group consisting of data processing,
4 data storage, access control, protocol translation, security including service discovery and
5 device authentication, and network control.

1 11. (Currently amended) The method of claim 10, further comprising:
2 performing real-time operations using the first processor, wherein the first
3 processor includes at least one real-time interface processor (RTIP) ~~of the at least one~~
4 ~~gateway;~~
5 performing high level processing functions using the second processor, wherein
6 the second processor includes at least one application processor ~~of the at least one~~
7 ~~gateway,~~ wherein the at least one gateway further comprises at least one interface port.

1 12. (Original) The method of claim 11, further comprising controlling at least one
2 high-speed bus of the at least one RTIP using at least one coupled device, wherein the at
3 least one gateway functions as an Internet Protocol (IP) router.

1 13. (Original) The method of claim 11, further comprising providing at least one
2 item selected from a group consisting of a tag, a bridge, and an interface with the at least
3 one interface port.

1 14. (Original) The method of claim 11, wherein the at least one interface port
2 includes at least one port selected from a group consisting of wired communication ports
3 and wireless communication ports.

- 1 15. (Original) The method of claim 10, wherein the at least one gateway includes
2 a first gateway coupled to a second gateway.
- 1 16. (Original) The method of claim 10, further comprising coupling the at least
2 one port node to at least one subnetwork.
- 1 17. (Original) The method of claim 10, further comprising coupling a first
2 vehicle bus and a second vehicle bus using the at least one gateway node, wherein the at
3 least one port node couples the at least one vehicle bus to the at least one peripheral
4 electronic device.
- 1 18. (Original) The method of claim 10, wherein the at least one port node
2 comprises at least one device selected from a group consisting of at least one processor,
3 at least one memory cache, at least one wireless modem, at least one network protocol, at
4 least one policy, and at least one wired local area network (LAN).
- 1 19. (Original) The method of claim 10, wherein the at least one port node
2 comprises at least one device selected from a group consisting of at least one micro real-
3 time interface processor (RTIP), at least one appliance interface, at least one
4 communication interface, and at least one memory device.
- 1 20. (Original) The method of claim 19, further comprising:
2 coupling the at least one appliance interface to at least one sensor;
3 coupling the at least one communication interface to at least one radio.
- 1 21. (Original) The method of claim 10, further comprising enabling operation of
2 the at least one peripheral electronic device within the network using interactions among
3 the at least one port node and at least one corresponding proxy, wherein the at least one
4 port node comprises at least one port node selected from a group consisting of a serial
5 network interface connector (SNIC) and a public network port (PNP).

1 22. (Original) The method of claim 1, wherein the at least one node comprises at
2 least one hybrid switch, wherein the at least one hybrid switch includes at least one
3 interface port coupled among at least one switch of a first speed and at least one switch of
4 a second speed, wherein each of the at least one switch of a first speed and the at least
5 one switch of a second speed are coupled to at least one port.

1 23. (Original) The method of claim 22, further comprising distributing at least
2 one switching function among the plurality of network elements using the at least one
3 hybrid switch.

1 24. (Original) The method of claim 22, further comprising:
2 coupling at least one application of a first type through the at least one port to the
3 at least one switch of a first speed;
4 coupling at least one application of a second type through the at least one port to
5 the at east one switch of a second speed.

1 25. (Original) The method of claim 1, further comprising coupling the at least
2 one node to at least one subnetwork comprising at least one device selected from a group
3 consisting of sensor devices, actuator devices, wired network devices, and wireless
4 network devices.

1 26. (Original) The method of claim 1, further comprising coupling at least one
2 router of the at least one node to the Internet using at least one device selected from a
3 group consisting of at least one bus and at least one communication device, wherein the
4 at least one bus is selected from a group consisting of an IEEE 1394 bus, a MOST bus, an
5 IDB-C, and an Ethernet bus, wherein the at least one communication device is selected
6 from a group consisting of a Bluetooth modem, an IEEE 802.11 radio, and a mobile
7 telephone.

1 27. (Original) The method of claim 1, further comprising generating at least one
2 hierarchy of communication alternatives in response to a determined position of a host

3 vehicle, wherein a selected communication alternative is used to communicate with at
4 least one local site.

1 28. (Original) The method of claim 1, further comprising controlling data
2 processing using at least one processing hierarchy that controls at least one event selected
3 from a group consisting of data classifications, data transfers, data queuing, data
4 combining, processing locations, and communications among the plurality of network
5 elements.

1 29. (Original) The method of claim 1, further comprising distributing the at least
2 one function among the plurality of network elements.

1 30. (Original) The method of claim 1, wherein the at least one function of the at
2 least one node includes at least one function selected from a group consisting of data
3 acquisition, data processing, communication management, data routing, data security,
4 programming, node operation, protocol translation, network management, and interfacing
5 with at least one communication physical layer including cellular telephony, wireline
6 telephone, satellite telephony, packet radio, microwave, optical.

1 31. (Original) The method of claim 30, further comprising distributing data
2 processing functions of at least one peripheral electronic device among at least one other
3 processor selected from a group consisting of the at least one node and the at least one
4 peripheral electronic device.

1 32. (Original) The method of claim 1, further comprising implementing at least
2 one security method selected from a group consisting of confounder codes, encrypted
3 transmissions, security policy-based communication protocols, blocking coupling with
4 unauthorized devices, and blocking commands from at least one class of device.

1 33. (Original) The method of claim 32, wherein the at least one security method
2 includes blocking denial of service attacks by decoupling at least one port node through

3 which unauthorized access is attempted and blocking at least one application at a
4 decoupled port node.

1 34. (Original) The method of claim 32, wherein the at least one security method
2 further includes at least one device selected from a group consisting of an ignition key, a
3 password device, a security display, and a designated authorization port, wherein at least
4 one connector is coupled to the designated authorization port to receive authorization for
5 coupling a device to the plurality of network elements.

1 35. (Original) The method of claim 1, further comprising automatically
2 organizing the plurality of network elements in response to the node information, wherein
3 the automatic organizing comprises automatically controlling data transfer, processing,
4 and storage among the plurality of network elements.

1 36. (Original) The method of claim 1, further comprising supporting at least one
2 level of synchronization among different subsets of the plurality of network elements,
3 wherein a first level of synchronization is supported among a first subset of the plurality
4 of network elements, wherein a second level of synchronization is support among a
5 second subset of the plurality of network elements.

1 37. (Original) The method of claim 1, further comprising self-assembling the
2 plurality of network elements, wherein search and acquisition modes of the at least one
3 node search for participating ones of the plurality of network elements, wherein a
4 determination is made whether each of the participating ones of the plurality of network
5 elements are permitted to join the vehicle internetworking using a message hierarchy,
6 wherein the plurality of network elements are surveyed at random intervals for new nodes
7 and missing nodes.

1 38. (Original) The method of claim 1, further comprising performing service
2 discovery, wherein service discovery comprises:
3 synchronizing the at least one node;

4 authenticating the at least one node;
5 determining at least one communication mode for the at least one node; and
6 informing the at least one node of resources available among the plurality of
7 network elements.

1 39. (Original) The method of claim 1, further comprising collecting data using
2 the at least one node, wherein at least one operation is performed on the data in response
3 to parameters established by a user, the at least one operation selected from a group
4 consisting of classification, routing, processing, storing, and fusing.

1 40. (Original) The method of claim 39, wherein the data is vehicle diagnostic
2 data, wherein diagnostic operations are performed in response to the data.

1 41. (Original) The method of claim 39, wherein routing comprises selecting at
2 least one communication type and at least one communication coupling for use in routing
3 the collected data.

1 42. (Original) The method of claim 39, wherein routing comprises selecting at
2 least one data type for routing, selecting at least one of the plurality of network elements
3 to which to route the selected data, selecting at least one route to the selected at least one
4 of the plurality of network elements, and routing the selected at least one data type to the
5 selected at least one of the plurality of network elements.

1 43. (Original) The method of claim 39, wherein processing comprises selecting at
2 least one data type for processing, selecting at least one processing type, selecting at least
3 one of the plurality of network elements to perform the selected at least one processing
4 type, and transferring the selected at least one data type to the selected at least one of the
5 plurality of network elements using at least one route through the sensor network.

1 44. (Original) The method of claim 43, further comprising aggregating processed
2 data for further processing.

1 45. (Original) The method of claim 43, further comprising:
2 aggregating processed data;
3 reporting aggregated data to at least one user.

1 46. (Original) The method of claim 39, wherein storing comprises selecting at
2 least one data type for storage, selecting at least one storage type, selecting at least one of
3 the plurality of network elements to perform the selected at least one storage type, and
4 transferring the selected at least one data type to the selected at least one of the plurality
5 of network elements using at least one route through the plurality of network elements.

1 47. (Original) The method of claim 39, wherein fusing comprises a first node
2 transmitting at least one query request to at least one other node, wherein the first node
3 collects data from the at least one other node in response to the at least one query request,
4 and processes the collected data.

1 48. (Original) The method of claim 1, wherein the plurality of network elements
2 comprise a plurality of application programming interfaces (APIs), wherein the APIs
3 include APIs for application support, database services, routing, security, network
4 management, and deployment.

1 49. (Original) The method of claim 48, further comprising:
2 hosting the APIs for application support, database services, and routing on at least
3 one gateway node;
4 sharing the APIs for security, network management, and deployment among at
5 least one gateway node and at least one port node.

1 50. (Original) The method of claim 48, further comprising:
2 layering the plurality of APIs;
3 enabling distributed resource management by providing network resource
4 information among the plurality of network elements;

5 establishing a synchronism hierarchy in response to the network resource
6 information;
7 controlling information transfer among the plurality of network elements using
8 the synchronism hierarchy.

1 51. (Original) The method of claim 1, further comprising supporting atomic
2 transactions.

1 52. (Original) The method of claim 1, wherein the at least one node includes
2 sensing, processing, communications, and storage devices supporting a plurality of
3 processing and protocol layers.

1 53. (Original) The method of claim 1, further comprising supporting at least one
2 communication mode selected from a group consisting of wireless communications,
3 wired communications, and hybrid wired and wireless communications.

1 54. (Original) The method of claim 1, further comprising coupling the at least
2 one node to the at least one remote computer using the plurality of network elements,
3 wherein the plurality of networks elements include at least one element selected from a
4 group consisting of at least one station gateway, at least one server, at least one repeater,
5 at least one interrogator, and at least one network, wherein the at least one network
6 includes wired networks, wireless networks, and hybrid wired and wireless networks.

1 55. (Original) The method of claim 54, wherein the at least one network
2 comprises at least one network selected from a group comprising the Internet, local area
3 networks, wide area networks, metropolitan area networks, and information service
4 stations.

1 56. (Original) The method of claim 54, further comprising providing remote
2 accessibility using World Wide Web-based tools to data, code, control, and security
3 functions, wherein data includes signals, wherein code includes signal processing,

4 decision support, and database elements, and wherein control includes operation of the
5 plurality of network elements.

1 57. (Original) The method of claim 1, wherein the plurality of network elements
2 comprise a plurality of network element sets, wherein the plurality of network element
3 sets are layered.

1 58. (Original) The method of claim 1, further comprising:
2 assembling a first network having a first node density using at least one node of a
3 first type;
4 assembling a second network having a second node density using at least one
5 node of a second type;
6 overlaying the second network onto the first network.

1 59. (Original) The method of claim 1, further comprising:
2 transferring software and data among the plurality of network elements, wherein
3 the transfer is remotely controllable;
4 downloading the software and data from at least one location selected from a
5 group consisting of storage devices of the plurality of network elements, external storage
6 devices, and remote storage devices.

1 60. (Original) The method of claim 1, further comprising:
2 managing the plurality of network elements as at least one distributed and active
3 database at least one distributed resource management protocol;
4 reusing the plurality of network elements among different applications;
5 using the plurality of network elements in multiple classes of applications.

1 61. (Original) The method of claim 1, further comprising transferring data among
2 the plurality of network elements using at least one coupling among the at least one node
3 and at least one external network, wherein the data includes vehicle service data,

4 diagnostic data, maintenance history data, security data, electronic mail, and
5 entertainment software.

1 62. (Original) The method of claim 1, further comprising transferring data among
2 the plurality of network elements using at least one coupling among the at least one
3 peripheral electronic device and at least one external network, wherein the data includes
4 vehicle service data, diagnostic data, maintenance history data, security data, electronic
5 mail, and entertainment software.

1 63. (Original) The method of claim 1, further comprising coupling the at least
2 one node to at least one diagnostic device of a host vehicle.

1 64. (Original) The method of claim 1, wherein the at least one node comprises at
2 least one diagnostic node of a host vehicle.

1 65. (Original) The method of claim 1, further comprising manipulating at least
2 one data item selected from a group consisting of vehicle assembly data, vehicle
3 maintenance data, vehicle diagnostics data, vehicle position data, vehicle operations
4 profile data, fleet management data, fleet reliability analysis data, security system data,
5 entertainment system data, and targeted advertising data.

1 66. (Currently amended) A method for internetworking, comprising:
2 coupling a plurality of network elements in a vehicle including at least one
3 electronic device among at least one node and at least one vehicle bus, wherein the at
4 least one node includes at least one gateway node in the vehicle, the gateway node
5 comprising a first processor performing real-time processes and a second processor
6 performing remaining processes other than the real-time processes;
7 remotely accessing the plurality of network elements using at least one wireless
8 Internet coupling and at least one remote computer;
9 manipulating network data including configuration and security data; and

10 providing secure and private interoperability among the plurality of network
11 elements.

1 67. (Currently amended) A computer readable medium containing executable
2 instructions which, when executed in a processing system, cause the processing system to
3 internetwork components by:

4 coupling a plurality of network elements in a vehicle including at least one node
5 and at least one vehicle bus among at least one peripheral electronic device, wherein the
6 at least one node includes at least one gateway node in the vehicle, the gateway node
7 comprising a first processor performing real-time processes and a second processor
8 performing remaining processes other than the real-time processes;

9 manipulating node information including configuration and security information;
10 automatically assembling and configuring the plurality of network elements in
11 response to the node information;

12 remotely controlling at least one function of the plurality of network elements;

13 and

14 providing secure interoperability among the plurality of network elements in
15 response to the node information.

1 68. (Currently amended) An electromagnetic medium containing executable
2 instructions which, when executed in a processing system, cause the processing system to
3 internetwork components by:

4 coupling a plurality of network elements in a vehicle including at least one node
5 and at least one vehicle bus among at least one peripheral electronic device, wherein the
6 at least one node includes at least one gateway node in the vehicle, the gateway node
7 comprising a first processor performing real-time processes and a second processor
8 performing remaining processes other than the real-time processes;

9 manipulating node information including configuration and security information;

10 automatically assembling and configuring the plurality of network elements in
11 response to the node information;

- 12 remotely controlling at least one function of the plurality of network elements;
- 13 and
- 14 providing secure interoperability among the plurality of network elements in
- 15 response to the node information.